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Description of Humoral Immunity and Cytokine Status in Dynamics of Laboratory Animals Undergoing Experimental Thymectomy

Igamova O.K.
Urgench State University

Relevance of the study. In the thymus, one of the immunocompetent cells of the immune system is T-lymphocyte proliferation and differentiation, including Treg, which controls the functioning of the immune system [4]. Hormones produced by the thymus also have a role in providing a primary and secondary immune response. Thymectomy negatively affects the immune system, as do other systems and organs of the body. However, it has not been practically studied to determine the indicators of the immune system in dynamics after the thymectomy, to evaluate the results of close and remote. There is also no data on the recovery times of immune system indicators after a thymectomy.

Material and methods. For experimental studies, 3-month-old white broodless rats weighing 160-180 GR were obtained (n=75). They are taken care of, Fed, divided into groups Nuraliev N.A. and hammual. (2016) [2,3]. it was carried out on the basis of recommendations in methodological manuals. Thymectomy Victoria R. Rendell et al. (2014) [5]. held on. All laboratory animals were classified into 2 groups: primary (n=60) and Control (n=15) groups. The main group was divided into 3 subgroups: Group 1-1 1 month after the thymectomy (n=20), Group 2 - 3 months after the thymectomy (n=20), Group 3-6 months after the thymectomy (N=20). These periods of the study made it possible to identify and evaluate the close, remote results of the external influence (thymectomy) carried out, as well as to determine whether pathological changes in the immune system are reversible or irreversible[1]. To assess the state of the immune system, laboratory animals were identified using serum IGA, IgM, IgG, IgE, procalcitonin and cytokine (IL-1, IL-10) concentrations IFA. Experimental groups were representative of one another, and studies were randomized. Statistical processing of the results obtained was carried out using variational statistical methods. In organizing and conducting research, the principles of evidence-based medicine were followed.

Results obtained. 6 months after the experimental thymectomy, the indicators of all representatives of humoral immunity were within the limits of the norm, although they were convincingly low after 1 month of mudat and began to recover after 3 months. 6 months after the thymectomy, Iga was 1.09 times lower than the control group, IgG was 1.17 times, Ige was 1.09 times more reliably detected ($P<0.05$), IgM was 1.11 times lower ($P>0.05$). All four representatives of humoral immunity also fully recovered after a 6-month period after the tymectomy and were within the norm. It is noteworthy that 6 months after the thymectomy, all immunoglobulin rates were statistically significantly higher than post-1 month results ($P<0.05$). The parameters of the restored humoral immunity, 3 months after the thymectomy, remained stable even after 6 months. If we compare the ratio of these immunoglobulins to one of their three

main classes (IgA, IgM, IgG), then the following results were obtained: control group - 1,00:1,21:9,06; 1 month after the thymectomy - 1,00:1,04:9,11; 3 months after the thymectomy - 1,00:1,17:9,86; 6 months after the thymectomy - 1,00:1,00:9,75. It turns out that not only did the trend and intensity of changes in their quantities become practically the same, but their ratio to one remained practically unchanged. Unlike immunoglobulins, the recovery of serum levels of procalcitonin was slow, and only after 6 months did it reach the limits of the parameters of the control group.

6 months after the thymectomy, the amount of cytokines increased convincingly. IL-1β cytokine was found to be convincingly higher than the control group 1.70 times ($p<0.001$) after 6 months, 2.42 times ($P<0.001$) after 1 month after thymectomy, and 1.86 times ($P<0.001$) according to 3-month period results. Similar different properties were found under IL-10, with the serum concentration of this cytokine in laboratory animals exceeding the norm in all terms, reaching its maximum 6 months after the thymectomy. This cytokine was characterized by a convincing multiple determination of 1.89 times ($p<0.001$) compared to control group parameters after a 6-month period, 1.21 times ($P<0.05$) according to data 1 month after the thymectomy, and 1.20 times ($p<0.05$) after 3 months. Such changes in the amount of cytokines have shown that the body has fully recovered after short-term secondary immunodeficiency, which occurs after a thymectomy in the functioning of the immune system.

Conclusion. After an experimental thymectomy, the concentration of immunoglobulins in the blood serum of white-breed rats went to the 3rd month and remained stable even after 6 months. After a period of 1 month after the thymectomy (close result), dysbalance was observed in IL-1β, IL-10 concentrates in white-breed rats, this dysbalance continued after 3 months, when intact animals increased convincingly. Even 6 months after the thymectomy, the IL-1β, and IL-10 concentrations continued to increase, reaching their post-thymectomy maximum.

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